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AC-700

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US Model
Canadian Model
AEP Model
UK Model

AC POWER ADAPTOR

SPECIFICATIONS

Power Requirements:	US, Canadian Model ---- AC 120V ac, 60Hz AEP Model ---------- AC 220V ac, 50/60Hz UK Model ---------- 240V ac, 50/60Hz
Rated Power:	79W
Output Voltage: (with AC Power Adaptor)	DC 14V ±5% (with rated power ±10% input, 1.6A dc load)
Output Current: (at Charging mode)	DC 2.1A ±10% (at battery voltage 10—16.5V)
Dimensions:	Approx. 107x80x305 mm (w/h/d) ($4^1/_4 \times 3^1/_4 \times 12^1/_8$ inches)
Weight:	Approx. 3.2kg (7 lbs 1oz) net

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES, LES VUES EXPLOSÉES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MICROFILM

SONY®
SERVICE MANUAL

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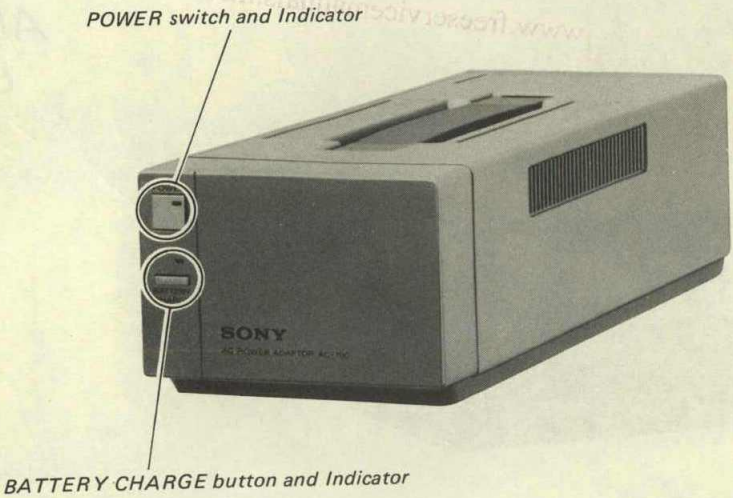
LOCATION



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SECTION 1
CIRCUIT DESCRIPTION

AC-700 is the ac power adaptor for PCM-F1 (digital audio processor). It also has the capability to charge the NP-1 rechargeable battery pack for PCM-F1.

– AC Power Adaptor

Figure 1 is the voltage, current and control section circuit diagram for AC-700. When PCM-F1 is connected to AC-700 operating as an AC power adaptor, reference voltage and load voltage are compared by the voltage control op amp (IC3), which controls series transistor Q3 so that the load voltage becomes 14V regulated voltage.

If load current is less than 2.1A (1.6A is normal) the current control op amp IC4 uses point A as the reference, and because the noninverted input terminal is biased to the positive side and the inverted input terminal to the negative side, the output terminal goes high and D15 cuts off.

Therefore, IC4 does not affect the operation of series transistor Q3.

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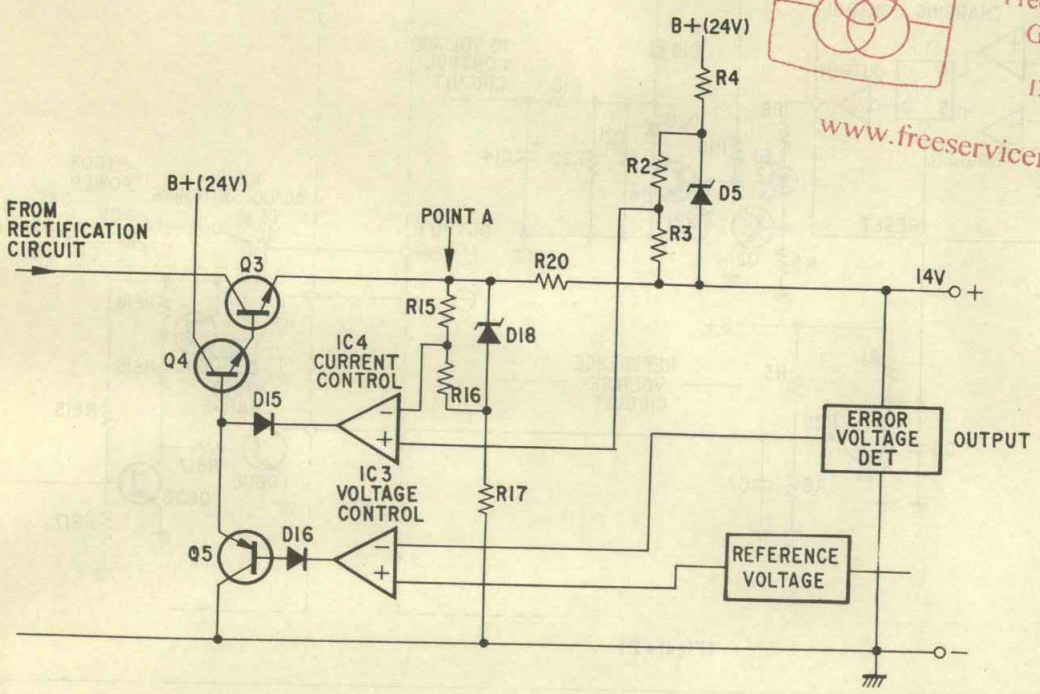

(Figure 1)

– Charging

Figure 2 is a circuit diagram of the charging control section prepared for charging. When the BATTERY CHARGE button (SW2) is pushed, the charging control IC (IC2) trigger terminal is grounded, flip-flop is set and the output terminal goes high.

Then the CHARGE lamp (LED2) lights up, Q2 goes on and Q6 goes off.

There are two zener diodes, D20 (for AC power adaptor) and D21 (for charging) in the reference voltage circuit, which are switched by Q6.

The zener voltage for D20 is lower than that of D21. When Q6 is on, D20 and D21 are connected parallel, but because D20 zener voltage is lower, D21 does not operate.

When Q6 is off (during charging), D20 is cut off and D21 generates reference voltage. Therefore, during charging, higher output voltage than for when operating as an AC power adaptor is supplied to the battery pack (NP-1) which is the load. However, when charging current goes over 2.1A,

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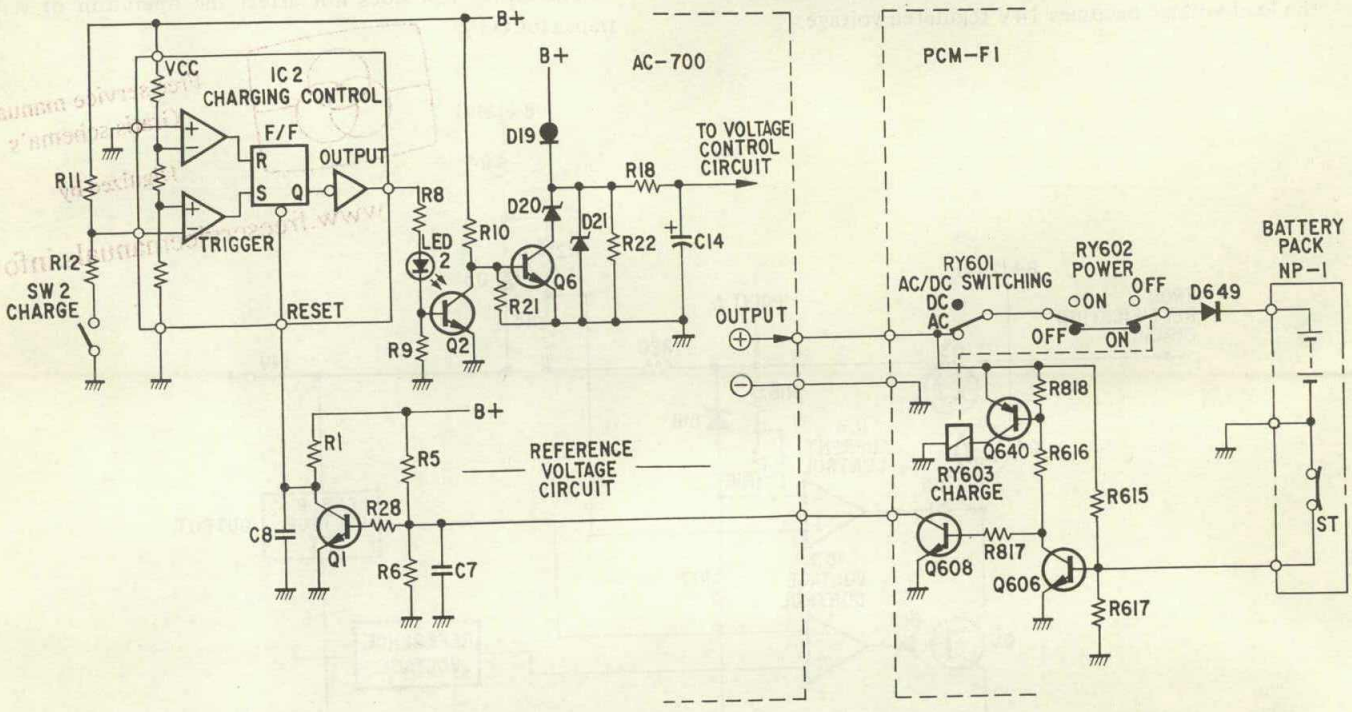
the voltage drop generated at current detection resistor R20 (see Fig. 1) is applied to the current control op amp's (IC4) noninverted input terminal and the output terminal shifts to low level. Then D15 turns on, series transistor Q3 V_{CE} gets larger and output voltage drops. As a result, charging current does not go over 2.1A but becomes 2.1A regulated current. When charging current is below 2.1A the load voltage becomes 17V regulated voltage because of the voltage control circuit.

When charging is completed, the internal temperature of battery pack NP-1 rises, the built-in thermostat ST operates and turns off.

When ST goes off, the PCM-F1 Q606 (see Fig. 2) goes on, Q640 goes on, RY603 is set and the charging circuit is interrupted. Then Q608 goes off, AC-700, Q1 goes on, IC2 reset terminal becomes 0V (low level), the output terminal becomes 0V (low level) and LED2 goes out to indicate charging completed.

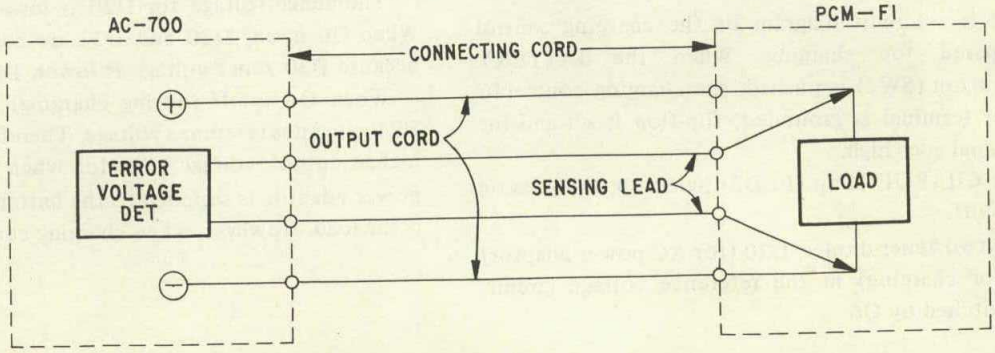


(Figure 2)

Remote Sensing

AC-700 utilizes remote sensing in the voltage control section error voltage detection circuit. When the load current for the output cord connecting the regulated voltage power supply output terminal and the load is large, an exceptionally large voltage drop results, adversely affecting the load side.

On AC-700, the error voltage detection is led not from the output terminal but through the connecting cord sensing lead directly from the PCM-F1 power supply input terminal, so the voltage drop because of the output cord and connector contact resistance is compensated for.



(Figure 3)

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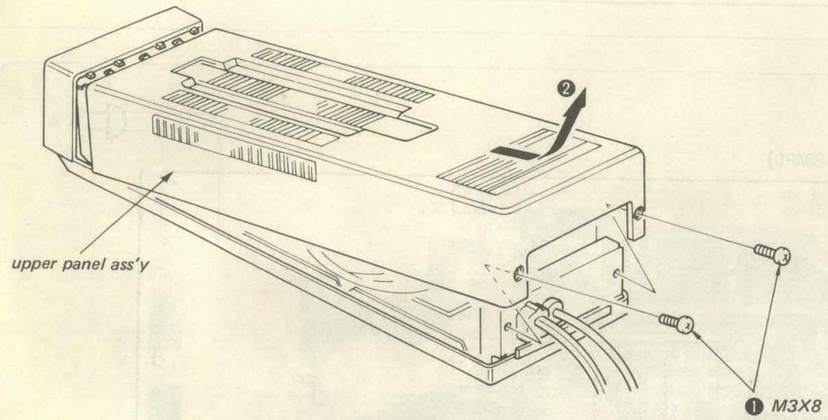
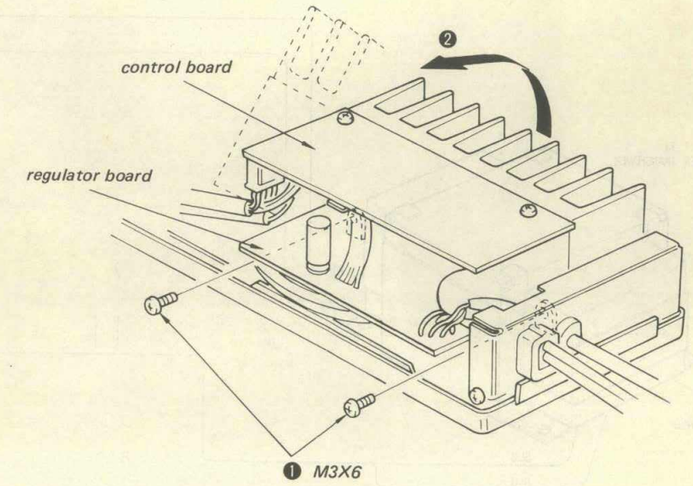
SECTION 2
DISASSEMBLY

- Remove the parts in the numerical order.

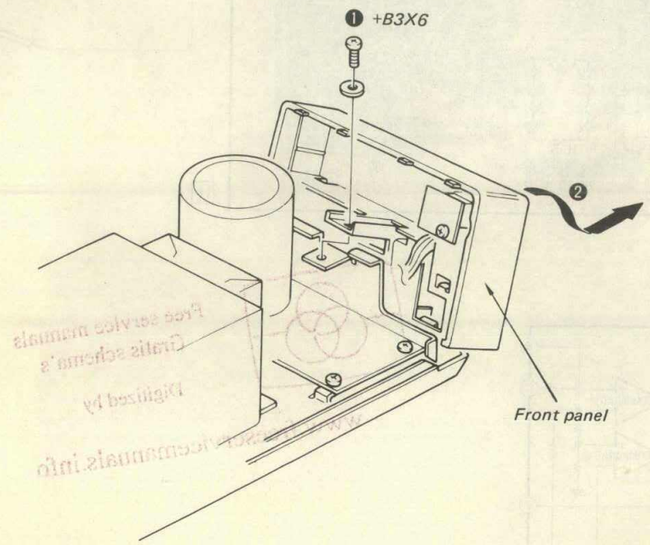
Upper Panel Ass'y Removal



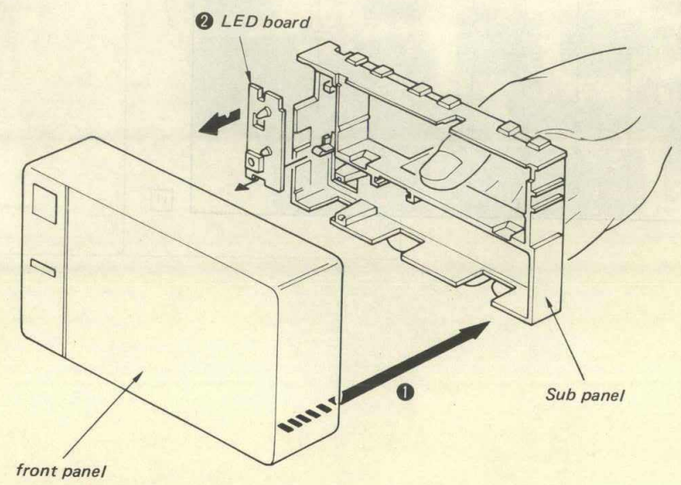
Control Board Block Removal



Front Panel Ass'y



LED Board Removal



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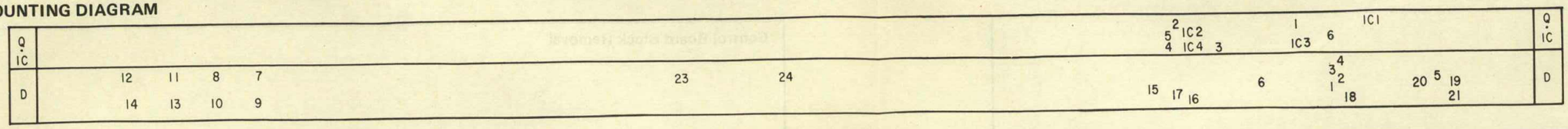
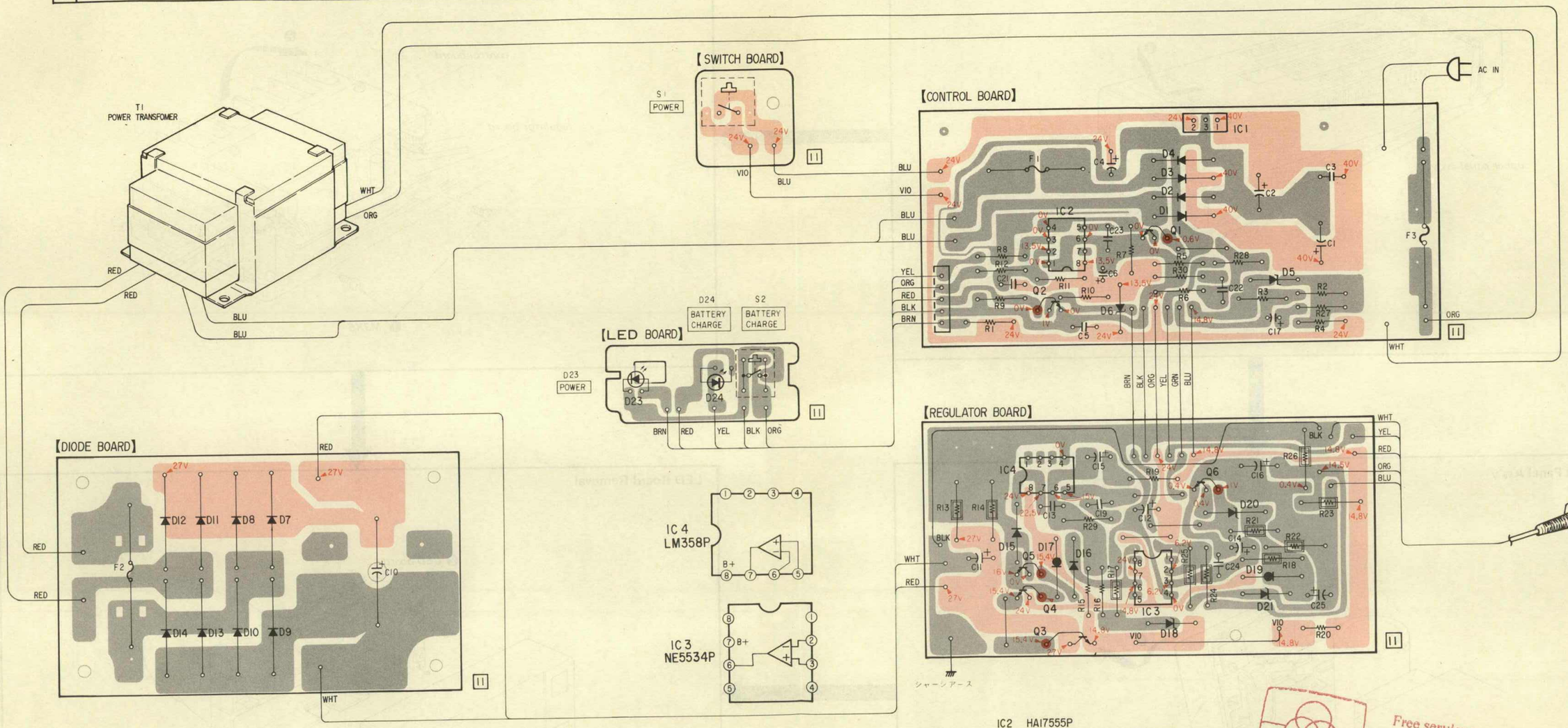
3-1. MOUNTING DIAGRAM





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- ○—: parts extracted from the component side.
- ■ : part mounted on the conductor side.
- ▒ : B+ pattern

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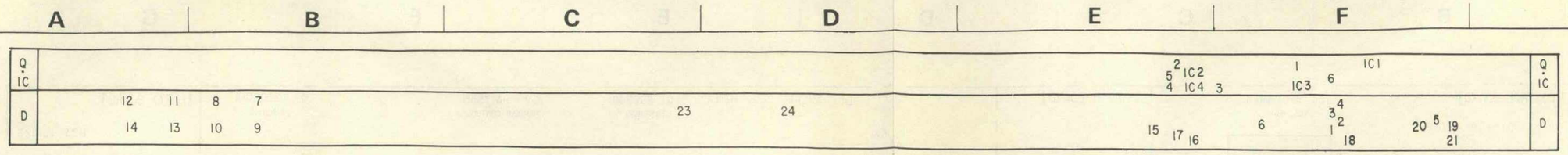
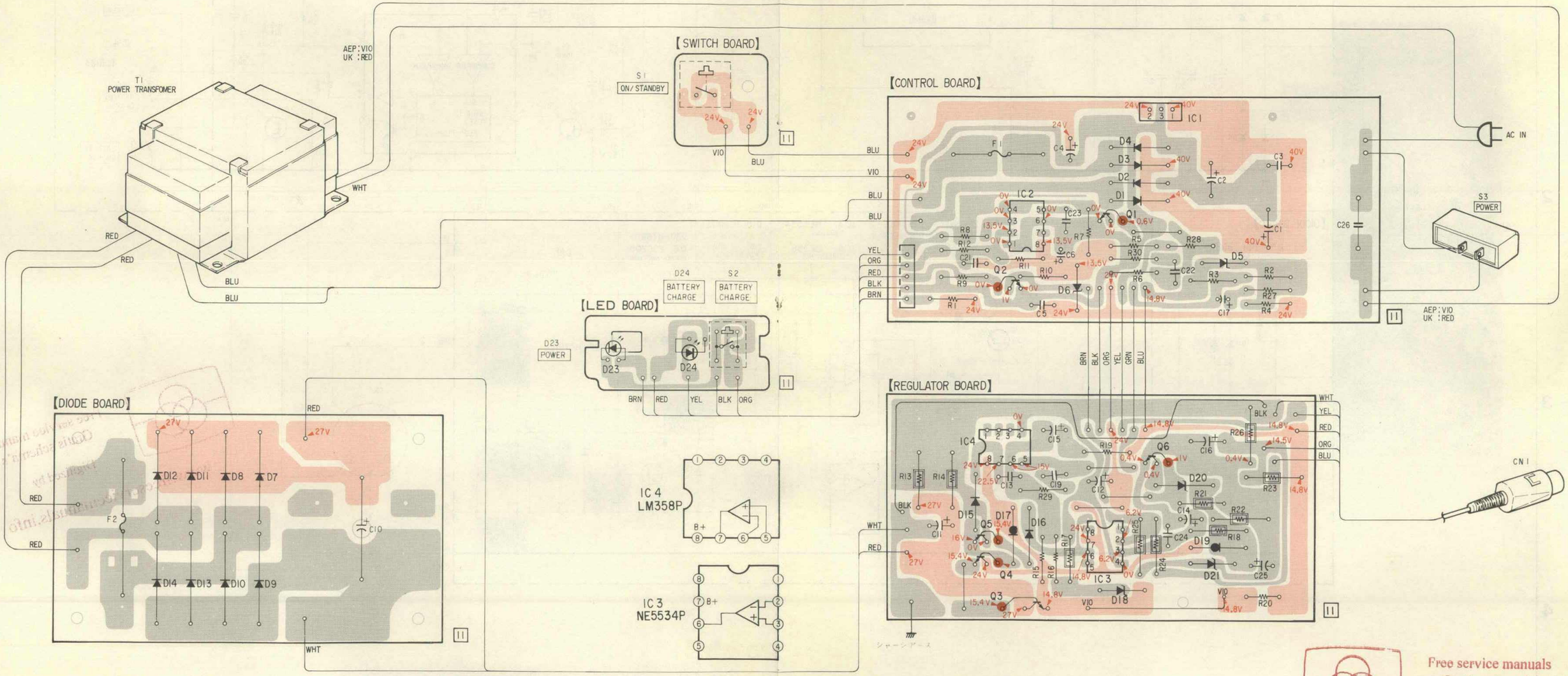
3-3. MOUNTING DIAGRAM





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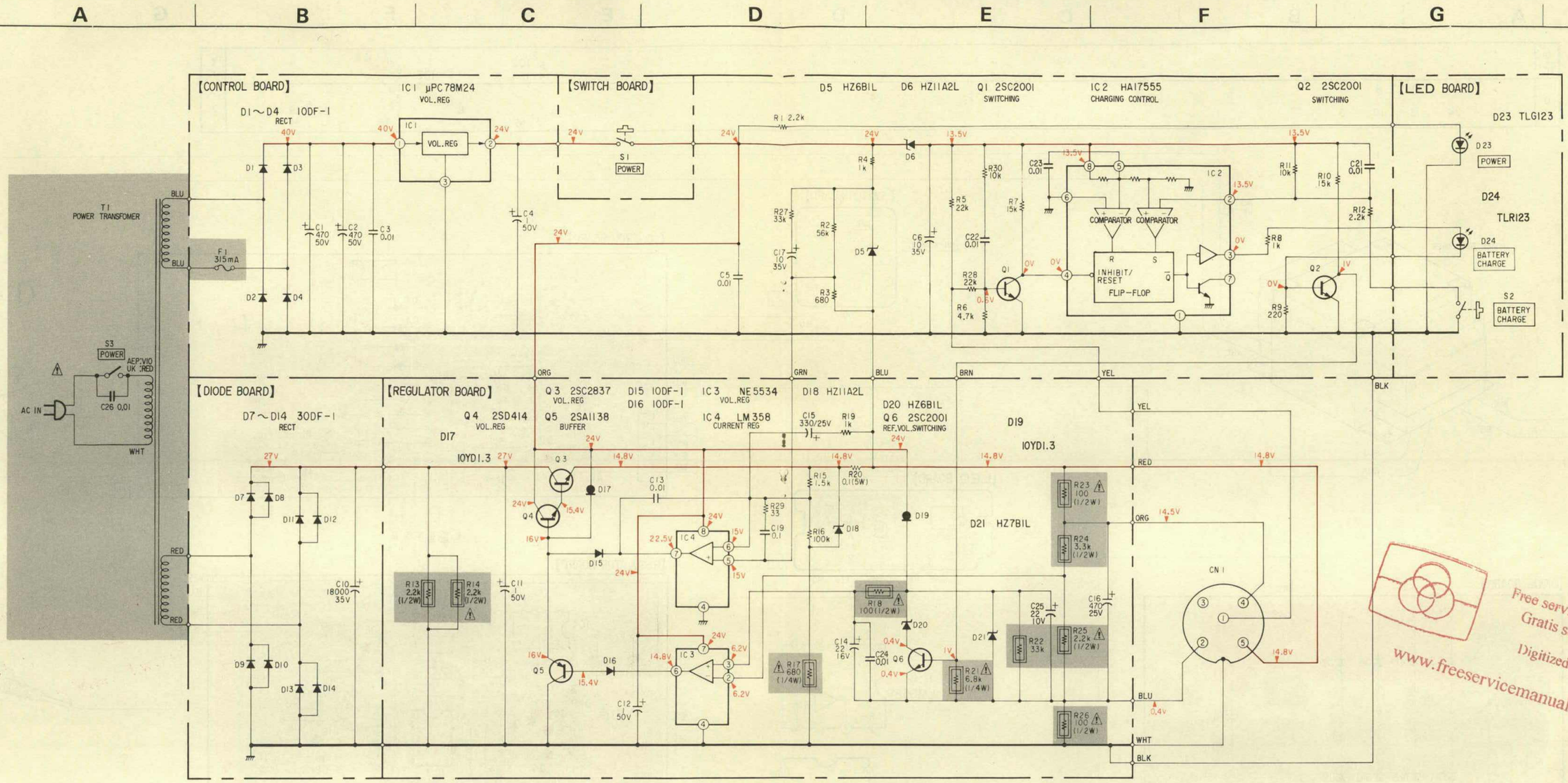
3-2. SCHEMATIC DIAGRAM



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Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Voltage are measured with a VOM (50kΩ/V)

- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- ⚠ : nonflammable resistor.
- ▭ : panel designation.
- ——— : B+ bus.
- Switch

Ref. No.	Switch	Position
S1	POWER	OFF
S2	BATTERY CHARGE	OFF

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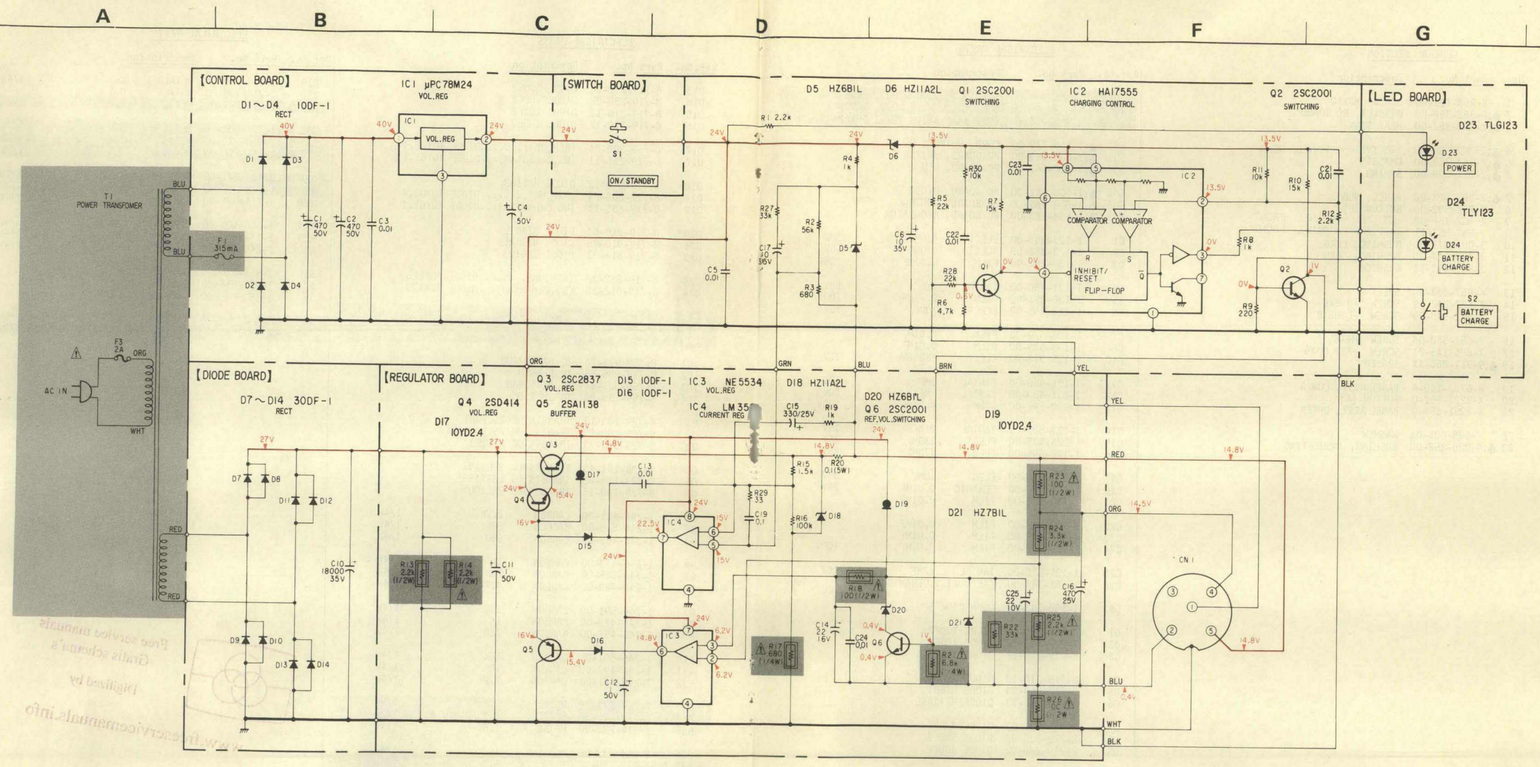
3-4. SCHEMATIC DIAGRAM



Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Note: Voltage are measured with a VOM (50kΩ/V)

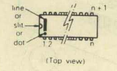
- All resistors are in ohms, ¼W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- : nonflammable resistor.
- : panel designation.
- : B+ bus.
- Switch

Ref. No.	Switch	Position
S1	POWER	OFF
S2	BATTERY CHARGE	OFF

- **Semiconductor Lead Layouts**

10DF1, 30DF1
10DF2, 30DF2
10YD2.4
10YG1.1
HZ6B1L
HZ11A2L
HZ11A3L
HZ7B1L
HZ7B2L

LM358P
NE555N
NE5534P
NE5534AN
μPC358C



TLG123
TLR123

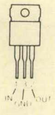
2SC2001

μA78M24UC

2SC2837

2SD414

μPC78M24



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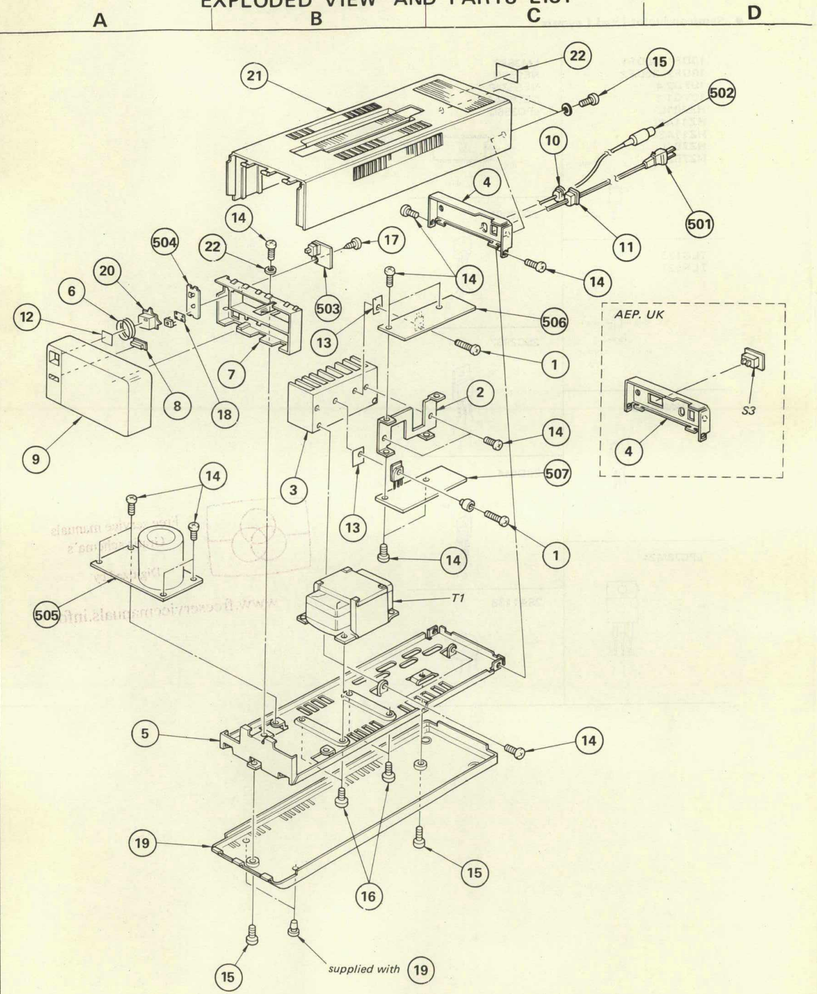
SECTION 4
EXPLODED VIEW AND PARTS LIST



GENERAL SECTION

No.	Part No.	Description
1	2-259-121-00	SCREW M3X10
2 ♦	2-362-366-00	BRACKET, PC BOARD
3 ♦	2-362-367-00	HEAT SINK
4 ♦	2-362-388-00	(US,CND)·····PANEL, REAR
5 ♦	2-362-369-00	CHASSIS
6 ♦	2-291-509-00	SPRING
7 ♦	2-291-527-00	PANEL, SUB
8	2-291-502-00	BUTTON (B)
9	2-362-357-00	(US,CND)·····PANEL, FRONT
9	2-362-357-11	(AEP,UK)·····PANEL, FRONT
10	3-005-073-00	BUSHING, CORD
11	3-703-244-00	BUSHING, CORD
12	3-831-441-11	CUSHION
13	4-857-833-00	SHEET
14	7-682-547-09	SCREW +B 3X6
15	7-682-548-09	SCREW +B M3X8
16	7-682-560-04	SCREW M4X6
17	7-685-145-21	SCREW +PTP M3X6
18 ♦	9-911-863-XX	SPACER
19	A-6703-160-A	PANEL ASSY, LOWER
20	X-2291-502-0	BUTTON (A)
21	X-2291-504-0	PANEL ASSY, UPPER
22	7-688-003-02	WASHER
23 ♦	4-026-252-00	BUSHING, INSULATING

ELECTRICAL PARTS

Ref.No.	Part No.	Description		
501 ⚠	1-555-795-00	(AEP)·····CORD, POWER		
501 ⚠	1-556-036-00	(UK)·····CORD, POWER		
501 ⚠	1-555-701-00	(US,Canadian)···CORD, POWER		
502	1-556-379-00	CORD, OUTPUT, DC		
503	1-608-159-00	PC BOARD, SWITCH		
504	1-608-160-00	PC BOARD, LED		
505	1-608-161-00	PC BOARD, DIODE		
506	1-608-162-00	PC BOARD, CONTROL		
507	1-608-163-00	PC BOARD, REGULATOR		
C1	1-123-363-00	ELECT	470MF	50V
C2	1-123-363-00	ELECT	470MF	50V
C3	1-130-297-00	FILM	0.01MF	100V
C4	1-131-450-00	TANTAL	1MF	50V
C5	1-130-297-00	FILM	0.01MF	100V
C6	1-123-356-00	ELECT	10MF	50V
C7	1-108-579-00	FILM	0.01MF	
C8	1-108-579-00	FILM	0.01MF	
C10	1-125-312-00	ELECT	18000MF	35V
C11	1-131-450-00	TANTAL	1MF	50V
C12	1-131-450-00	TANTAL	1MF	50V
C13	1-130-297-00	FILM	0.01MF	100V
C14	1-123-520-00	TANTAL	22MF	16V
C15	1-123-335-00	ELECT	330MF	25V
C16	1-123-696-00	ELECT	470MF	25V
C17	1-123-356-00	ELECT	10MF	35V
C19	1-161-773-00	CERAMIC	0.01MF	25V
C21	1-108-579-00	FILM	0.01MF	
C22	1-108-579-00	FILM	0.01MF	
C23	1-108-579-00	FILM	0.01MF	
C24	1-130-297-00	FILM	0.01MF	100V
C25	1-131-520-00	TANTAL	22MF	16V
C26	1-161-744-00	(AEP,UK)...CERAMIC	0.01MF	400V
CN1	1-508-743-00	CONNECTOR 5P		
D1	8-719-210-12	DIODE 10DF2		
D2	8-719-210-12	DIODE 10DF2		
D3	8-719-210-12	DIODE 10DF2		
D4	8-719-210-12	DIODE 10DF2		
D5	8-719-910-64	DIODE HZ6B1L		
D6	8-719-910-13	DIODE HZ11A3L		
D7	8-719-230-02	DIODE 30DF2		
D8	8-719-230-02	DIODE 30DF2		
D9	8-719-230-02	DIODE 30DF2		
D10	8-719-230-02	DIODE 30DF2		
D11	8-719-230-02	DIODE 30DF2		
D12	8-719-230-02	DIODE 30DF2		

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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ELECTRICAL PARTS

Ref.No.	Part No.	Description		
D13	8-719-230-02	DIODE 30DF2		
D14	8-719-230-02	DIODE 30DF2		
D15	8-719-210-12	DIODE 10DF2		
D16	8-719-210-12	DIODE 10DF2		
D17	8-719-200-24	(AEP,UK)·····DIODE 10YD2.4		
D17	8-719-261-11	(US,Canadian)···DIODE 10YG1.1		
D18	8-719-910-13	DIODE HZ11A3L		
D19	8-719-200-24	(AEP,UK)·····DIODE 10YD2.4		
D19	8-719-261-11	(US,Canadian)···DIODE 10YG1.1		
D20	8-719-910-64	DIODE HZ6B1L		
D21	8-719-910-75	DIODE HZ7B2L		
D23	8-719-812-33	DIODE TLG123		
D24	8-719-812-32	(AEP,UK)·····DIODE TLY123		
D24	8-719-812-31	(US,Canadian)···DIODE TLR123		
F1 ⚠	1-532-447-XX	FUSE 0.315A		
F2 ⚠	1-532-630-00	FUSE 5A		
F3 ⚠	1-532-268-00	(US,Canadian)···FUSE 2A		
IC1	8-759-978-24	IC UA78M24UC		
IC2	8-759-905-55	IC NE555N		
IC3	8-759-905-34	IC NE5534AN		
IC4	8-759-135-80	IC UPC358C		
Q1	8-729-100-13	TRANSISTOR 2SC2001		
Q2	8-729-100-13	TRANSISTOR 2SC2001		
Q3	8-729-383-73	TRANSISTOR 2SC2837		
Q4	8-729-141-43	TRANSISTOR 2SD414		
Q5	8-729-113-82	TRANSISTOR 2SA1138		
Q6	8-729-100-13	TRANSISTOR 2SC2001		
R1	1-246-481-00	CARBON	2.2K	1/4W
R2	1-246-515-00	CARBON	56K	1/4W
R3	1-246-469-00	CARBON	680	1/4W
R4	1-246-473-00	CARBON	1K	1/4W
R5	1-246-505-00	CARBON	22K	1/4W
R6	1-246-489-00	CARBON	4.7K	1/4W
R7	1-246-501-00	CARBON	15K	1/4W
R8	1-246-473-00	CARBON	1K	1/4W
R9	1-246-457-00	CARBON	220	1/4W
R10	1-246-501-00	CARBON	15K	1/4W
R11	1-246-497-00	CARBON	10K	1/4W
R12	1-246-481-00	CARBON	2.2K	1/4W
R13 ⚠	1-214-872-00	METAL	2.2K	1/2W F
R14 ⚠	1-214-872-00	METAL	2.2K	1/2W F
R15	1-214-733-00	METAL	1.5K	1/4W
R16	1-214-777-00	METAL	100K	1/4W
R17 ⚠	1-214-749-00	METAL	6.8K	1/4W F
R18 ⚠	1-214-830-00	METAL	100	1/2W F

ELECTRICAL PARTS

Ref.No.	Part No.	Description		
R19	1-214-729-00	METAL	1K	1/4W
R20	1-214-789-00	METAL	0.1	
R21 ⚠	1-214-749-00	METAL	6.8K	1/4W F
R22 ⚠	1-214-901-00	METAL	33K	1/2W F
R23 ⚠	1-214-830-00	METAL	100	1/2W F
R24 ⚠	1-214-876-00	METAL	3.3K	1/2W F
R25 ⚠	1-214-872-00	METAL	2.2K	1/2W F
R26 ⚠	1-214-830-00	METAL	100	1/2W F
R27	1-214-096-00	CARBON	33K	1/4W
R28	1-246-505-00	CARBON	22K	1/4W
R29	1-214-069-00	METAL	33K	1/4W
R30	1-246-497-00	CARBON	10K	1/4W
S1	1-553-926-00	SWITCH, PUSH		
S2	1-553-856-00	SWITCH,		
S3	1-553-575-00	(AEP,UK)...SWITCH		
T1	⚠ 1-447-441-00	(AEP,UK)·····TRANSFORMER, POWER		
T1	⚠ 1-447-440-00	(US,Canadian)···TRANSFORMER, POWER		

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NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked " ♦ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:
- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.
- F : nonflammable

COILS
- MMH : mH, UH : μH

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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